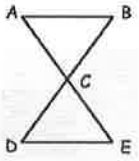
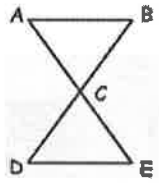
Geo Trig Name_____

Congruent Triangle Proofs

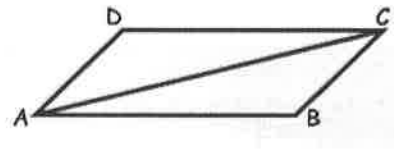


Given: AB = DE;
C is the midpoint of $\overline{AE}$ and $\overline{DB}$
Prove: $\triangle ABC \cong \triangle EDC$

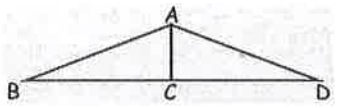
In your notes



Given: C is the midpoint of $\overline{AE}$ and $\overline{DB}$
Prove: $\triangle ABC \cong \triangle EDC$



Given: $\overline{AB} \parallel \overline{DC}$; $\overline{AB} \cong \overline{DC}$
Prove: $\overline{AD} \cong \overline{CB}$

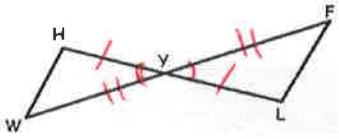


Given: $\overline{AC} \perp \overline{BD}$; $\overline{AB} \cong \overline{AD}$
Prove: $\angle B \cong \angle D$

In your notes

Given: E is the midpoint of $\overline{BC}$; $\angle A \cong \angle D$
Prove: E is the midpoint of $\overline{AD}$

S	R
① E is the Midpoint of $\overline{BC}$	① Given
② $\overline{BE} \cong \overline{EC}$	② Definition of Midpoint
③ $\angle A \cong \angle D$	③ Given
④ $\angle BEA \cong \angle DEC$	④ Vertical Angle theorem
⑤ $\Delta BEA \cong \Delta CED$	⑤ AAS
⑥ $AE \cong ED$	⑥ CPCTC
⑦ E is the midpoint of $\overline{AD}$	⑦ Definition of Midpoint



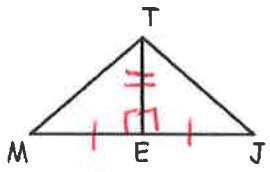
Given: Y is the midpoint of $\overline{HL}$ and $\overline{FW}$
Prove: $\overline{WH} \parallel \overline{FL}$

S	R
① Y is the midpoint of $\overline{HL}$	① Given
② $\overline{HY} \cong \overline{YL}$	② Definition of Midpoint
③ Y is the midpoint of $\overline{FW}$	③ Given
④ $WY \cong YF$	④ Definition of midpoint
⑤ $\angle HYW \cong \angle FYL$	⑤ Vertical Angles are congruent
⑥ $\Delta HYW \cong \Delta LYF$	⑥ SAS
⑦ $\angle H \cong \angle L$	⑦ CPCTC
⑧ $\overline{WH} \parallel \overline{FL}$	⑧ If alternate interior angles are congruent, then lines are parallel

HW #15 Name_____

Proof Example 1

Given: E is the midpoint of $\overline{MJ}$
$\overline{TE} \perp \overline{MJ}$
Prove: $\Delta MET \cong \Delta JET$

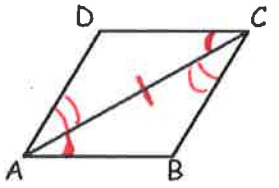


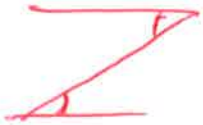
S	R
(1) E is the midpoint of $\overline{MJ}$	(1) Given
(5)(2) $\overline{ME} \cong \overline{EJ}$	(2) Definition of midpoint
(3) $TE \perp MJ$	(3) Given
(4) $\angle MET$ and $\angle JET$ are right angles	(4) Definition of perpendicular lines
(5) $m\angle MET = 90°$, $m\angle JET = 90°$	(5) Definition of right angles
(6) $m\angle MET = m\angle JET$	(6) Substitution
(A) $\angle MET \cong \angle JET$	
(5)(7) $TE \cong TE$	(7) Reflexive Property
(8) $\Delta MET \cong \Delta JET$	(8) SAS

Proof Example 2

Given: $\overline{AB} \parallel \overline{CD}$
$\angle DAC \cong \angle BCA$

Prove: $\Delta ABC \cong \Delta CDA$



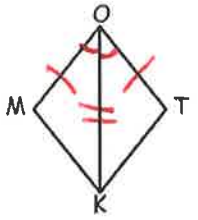


S	R
(1) $\overline{AB} \parallel \overline{CD}$	(1) Given
(A)(2) $\angle DCA \cong \angle BAC$	(2) If lines are parallel, then alternate interior angles are congruent
(A)(3) $\angle DAC \cong \angle BCA$	(3) Given
(5)(4) $\overline{AC} \cong \overline{AC}$	(4) Reflexive property
(5) $\Delta ABC \cong \Delta CDA$	(5) ASA

Proof Example 3

Given: $\overline{OK}$ bisects $\angle MOT$
$\overline{OM} \cong \overline{OT}$

Prove: $\Delta MOK \cong \Delta TOK$



S	R
① $\overline{OK}$ bisects $\angle MOT$	① Given
② $\angle MOK \cong \angle TOK$	② Definition of angle bisector
③ $\overline{OM} \cong \overline{OT}$	③ Given
④ $\overline{OK} \cong \overline{OK}$	④ Reflexive Property
⑤ $\Delta MOK \cong \Delta TOK$	⑤ SAS